

AMENDMENTS TO THE DRAWINGS

The attached sheet of drawing includes changes to FIG. 1. This sheet, which includes FIG. 1, replaces the original sheet including FIG. 1. In FIG. 1, a label “60” has been added.

Attachments: Replacement Sheet

Annotated Sheet Showing Changes

REMARKS

Claims 1, 2, 5, 6, 8-11, 13-15, and 19-20 remain pending in the application.

Claims 1 and 15 are currently amended. Claim 7 is currently cancelled. Claim 20 is newly added. Applicants respectfully request for allowance of all pending claims.

Objections to Drawings

Examiner objects to the drawings as they fail to show every feature of the invention specified in the claims. Specifically, Examiner requires that the “injecting means extending about the body” and the “means for reciprocally moving that is arranged to rotate the shaft” be shown in the drawings.

Applicants respectfully submit that the “injecting means extending about the body” is shown in FIG. 1. The injecting means, in the context of the invention, comprises for example a nozzle 24, and a helical channel 26 located “about” the internal bore of the fitting 22. *See, paragraph [0027].* Purge gas is received at the base of the channel 26, and spirals up the channel 26 on the outside of the sleeve 16. *Id.* Thus, the injecting means is clearly shown in FIG. 1 as having the channel 26 extending about the body of claimed apparatus.

Applicants respectfully submit that the “means for reciprocally moving that is arranged to rotate the shaft” is shown in the amended FIG. 1, in which a label 60 is added to generally indicate the means that rotates the shaft 30.

The drawings in a non-provisional application must show every feature of the invention specified in the claims. *37 C.F.R. §1.83(a).* However, conventional features disclosed in the description and claims, where their detailed illustration is not essential

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for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation. 37 C.F.R. §1.83(a). In the present application, a detailed illustration of the means that rotates the shaft is not essential for a proper understanding of the invention. As described in the amended specification:

A variety of pneumatic cylinders 60 are commercially available (for example, single or double acting, with or without spring return, with fixed or rotating shaft), all of which could be used. A preferred embodiment uses a double acting pneumatic cylinder with a rotating shaft, magnetic piston, and cushioned end stops.

Given the infinite number of the conventional rotation means available, detailed illustrations of them can be impractical if not impossible in the context of the invention. Thus, the label 60 symbolically representing the variety of conventional design choices that are commercially available is proper under 37 C.F.R. §1.83(a).

Rejections under 35 U.S.C. §112

Claims 10 and 15 are rejected under 35 U.S.C. 112, as it is unclear to Examiner how the means for reciprocally moving with the function of rotating the shaft or how the double acting pneumatic cylinder functions to rotate the shaft.

The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation. *In re Buchner*, 929 F.2d 660, 661 (Fed. Cir.

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1991). A patent need not teach, and preferably omits what is well known in the art.

MPEP 2164.01, Ed. 8, Rev. 2 (May, 2002).

As discussed above, the claimed apparatus as described in the specification can employ a variety of designs for rotating the shaft, and the double acting pneumatic cylinder is merely one of the design choices. Many designs are commercially available and well known to people reasonably skilled in the art, and inclusion of them in the claimed invention can be readily carried out without undue experimentation. Thus, their detailed descriptions are properly omitted from the specification accordingly to the drafting guidelines provided by MPEP.

As such, Applicants respectfully request that the rejections to claims 10 and 15 under section 112 be withdrawn.

Rejections under 35 U.S.C. §102

Claims 1, 2, 5, 8-11, 13-15 and 19

Claims 1, 2, 5, 8-11, 13-15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,090,183 to Awaji (hereinafter referred to as "Awaji") in view of U.S. Patent No. 6,263,535 to Wang (hereinafter referred to as "Wang") and U.S. Patent No. 5,659,915 to Dhingra (hereinafter referred to as "Dhingra").

Independent claim 1, as amended, is directed to an apparatus for reducing clogging of a pipe, the apparatus comprising a body having an open end adapted to be detachably connected to an aperture of the pipe, a shaft moveable within the body, a scraper attached to one end of the shaft, means for reciprocally moving the shaft to urge the scraper into the pipe to dislodge particulates deposited within the pipe and to

withdraw the scraper from the pipe, and injecting means extending about the body for injecting heated compressed gas into the body to inhibit particulate deposition, wherein the scraper is a helical coil that is flexible in a longitudinal direction of the body.

Awaji does not teach that the scraper is a helical coil that is flexible in a longitudinal direction of the body. Awaji teaches a spiral brush 11 having a central shaft 11a that is rigid in the longitudinal direction. *See, FIG. 1.* In Awaji, if the shaft 11a is compressed in the longitudinal direction, it is likely to bend or break, thereby causing damages to the brush hair 11b. *See, FIG. 1.* Unlike Awaji, the helical coil of the claimed invention is flexible in accommodating compression in the longitudinal. For example, as shown in FIG. 1, the coil 26 is constructed without a central shaft to provide the desired flexibility. As discussed in page 3 of the specification:

However, if the scraper was rigid, tough deposits could deform the scraper and damage the shaft. Therefore, a preferred embodiment is a helical coil, due to its innate flexibility and multiple surfaces for removing tough deposits.

Furthermore, coils and brushes are not equivalents in the context of the invention. The coil of the claimed invention performs better in term of avoiding accumulation of particulates than Awaji's spiral brush 11. In Awaji, only the edges of the brush hair 11b are in physical contact with the electrical heater 10 via the processing chamber 8. Thus, the edges of the brush hair 11b would have a higher temperature than that of the inner parts, such as the inner brush hair 11b and the central shaft 11a. As a result, the colder inside areas would tend to accumulate particulates. Unlike Awaji, the coil of the claimed invention would have a uniform temperature, and therefore is less likely to have a cold area that accumulates particulates.

Wang and Dhingra are cited for their mechanisms of moving a shaft reciprocally in a linear direction. They do not cure the deficiencies of Awaji.

As such, independent claim 1 is patentable over Awaji in view of Wang and Dhingra under section 103. Accordingly, claims 2, 5, 8-11, 13, and 14 that depend from claim 1 and include all the limitations recited therein are patentable over the cited references, as well.

Independent claim 15 comprises language “the scraper is a helical coil that is flexible in a longitudinal direction of the body.” For the same reasons discussed above, claim 15 is patentable over Awaji in view of Wang and Dhingra under section 103. Accordingly, claim 19 that depends on claim 15 and includes all the limitations recited therein is patentable over the cited references, as well.

Claims 6 and 7

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Awaji, Wang, Dhingra as applied to claim 1 and further in view of G.B. Patent No. 2,342,372 to Head (hereinafter referred to as “Head”).

Claim 6 depends on independent claim 1 and includes all the limitations recited therein. For the reasons discussed above, it is therefore patentable over the cited references.

Claim 7 is cancelled.

Claim 20

The newly added claim 20 provides “the injecting means comprises a helical channel for directing the compressed gas about the body.” Support for such amended can be found as the label 26 in FIG. 1, and in page 7 of the specification. It is noted that none of the cited reference teaches or suggests such helical channel.

CONCLUSION

Applicants have made an earnest attempt to place this application in an allowable form. In view of the foregoing remarks, it is respectfully submitted that the pending claims are drawn to a novel subject matter, patentably distinguishable over the prior art of record. Examiner is therefore, respectfully requested to reconsider and withdraw the outstanding rejections.

Applicant does not believe that any additional fee is due, but as a precaution, the Commissioner is hereby authorized to charge any additional fee to deposit account number 50-4244.

Should Examiner deem that any further clarification is desirable, Examiner is invited to telephone the undersigned at the below listed telephone number.

Respectfully submitted,

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